11. Susan E. Woodward is a consultant to MiCRA. Her primary expertise is financial economics. Dr. Woodward was chief economist at the Securities and Exchange Commission from 1992 to 1995, where she worked on SEC enforcement matters and on regulatory issues in corporate finance, stock market regulation, and mutual funds. At the U.S. Department of Housing and Urban Development, from 1987-92, she was Deputy Assistant Secretary and chief economist. From 1985 to 1987, she was senior staff economist for financial markets and institutions at the Council of Economic Advisors, where she worked on a variety of issues, including corporate governance, pension policy, bank and thrift regulation, and federal credit programs.

12. Prior to her government service, Dr. Woodward held faculty positions at UCLA, UC Santa Barbara, and the University of Rochester, where she taught corporate finance, investments, and price theory. She has served as an expert on numerous securities fraud and related matters, and testified in tax court for the Internal Revenue Service. She holds a B.A. and a Ph.D. from UCLA. She has written and published on a variety of topics in financial economics. Dr. Woodward's Curriculum Vita is attached to this declaration.

Will UNE Availability at TELRIC Discourage Investment and Innovation?

13. The JS&T affidavit addresses the impact of requiring network elements to be available at TELRIC on the incentives for the ILECs to make investments and to innovate.

14. The first prong of JS&T's argument notes that the general effect of the deregulation of local telephone service envisioned in the 1996 Act is to lower the rate of return to the existing assets of the ILECs. Since the goal of the Act was to address the acknowledged degree of monopoly in the provision of local telephone service, this should not come as a surprise. But in their eagerness to apply basic corporate finance to the situation of the ILECs, JS&T confuse average return on extant assets and marginal returns to new investments and thus make a flawed prediction about whether the ILECs will be reluctant to invest in the new competitive environment.

15. We fully agree that making elements available at TELRIC may deprive the ILECs of market power and lower their average returns to assets. But competition will have a salutary effect on the marginal return to new investment as that new investment becomes necessary for the ILECs' survival. With competition, investment in new products or technologies, and in cost savings and quality improvements, becomes essential to preserve as much as possible of the market value of the incumbent's asset base. Thus, competition increases the marginal return to investment by the incumbent at the same time as it reduces the average return on the incumbent's extant assets down toward the competitive level. As an example close to home, consider what competition from cable service has done to the ILECs' deployment of ADSL. Here, Selwyn,

Kravtin and Coleman argue that competition from cable service has accelerated the ILECs deployment of ADSL.[1] Though ADSL technology has been available previously, the ILECs made no attempt to make it available to their customers until the customers were offered cable access by the ILECs' competitors.

16. Moreover, the relevant issue is the effect of access at TELRIC on total investment in the local exchange market, not just on investment by the ILEC. As in any market facing competition for the first time, while we might expect that competition would spur investment by the incumbent, the relevant question is whether investment in the market, i.e., investment by the incumbent and new entrants combined, rises. If the incumbent, for whatever reason, chooses not to fight to preserve its market position, the fault is its own and the loss is to its shareholders, and this outcome is not a policy concern so long as investment and output by the entrants more than makes up for any reduction in investment by the incumbent.

Will the Competitors be Free Riding on TELRIC?

17. JS&T see access for CLECs to ILEC network elements at TELRIC prices as reducing the ILECs' incentive to invest. The main flaw in their argument is that it misses the point that under a scheme of network element unbundling, the ILEC and the CLEC are jointly providing service using the same network. Any new investments do not change their relative positions with respect to cost and quality; the absolute positions are improved for both parties by the investment when economies of scale are present, which is precisely the circumstance under which a CLEC will elect to share those assets when offered at TELRIC prices. Indeed, if the ILEC and its competitors were not competing for the same customers (but rather for some reason served different groups of customers in the same geographic area, using the same facilities), then the ILEC would actually find it profitable to offer CLECs access to its network elements at TELRIC, since the ILEC more than breaks even when the facility is priced at TELRIC. Thus, the only way that the ILEC's incentive to invest is reduced is if the increased investment causes product prices to fall, i.e., consumers benefit. Any "harm" to the ILEC, therefore, cannot be what is referred to in antitrust parlance as "antitrust injury", or "harm to competition", but is simply harm to a competitor.

18. In economics parlance, such a phenomenon is a "pecuniary externality," not a "market failure." Requiring access at TELRIC may "harm" the ILEC, in the sense that it reduces the profits earned by the ILEC, but that is the kind of "pecuniary" harm to competitors that results from competition, not the genuine harm that comes from one party affecting the production function of the other (e.g., through externalities or free riding). When a new plumber moves to a

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[1] See Lee Selwyn, Patricia Kravtin, and Scott Coleman, "Building a Broadband America: The Competitive Keys to the Future of the Internet," Economics and Technology, Inc., May 1999.

small town, her entry may depress the wages of the incumbent plumbers. The fact that her decision to enter does not incorporate the impact she will have on the other plumbers' wages is not a market failure, it is the market at work, and is a form of pecuniary externality.

Should an Option Premium or other Risk Premium be added to TELRIC?

19. S&T argue, as Hausman has argued before,[2] that allowing the ILECs' competitors to access network elements at TELRIC increases the likelihood that the ILECs' facilities will go unused (if the competitors choose later not to renew their leases) and their costs unrecovered. We believe just the opposite. Which way one comes down depends on whether competition for telephone customers resembles a game of musical chairs or the extension of telephone service to a new set of customers on Mars.

20. Let us elaborate. The customers are playing musical chairs when they are always either a direct customer of the ILEC or a direct customer of one or more of the CLECs who lease the ILEC's network elements. In either case, they are -- directly or indirectly --- customers of the ILEC's facilities. Thus, the facilities are always in use. So long as the ILEC gives the CLECs sufficiently good service and pricing that they do not build their own duplicate facilities (and there are powerful cost reasons for the CLECs not to build when the cost of duplication is high), there is little danger to the ILEC of idle facilities because the customers are always there and connect to those facilities either directly or indirectly.

21. In contrast, if the ILEC, by denying access to its facilities, forces the CLECs to build their own facilities, then any fluctuation in the ILEC's market share will cause a corresponding fluctuation in the level of capacity utilization at the ILEC's upstream facilities. A higher variance in capacity utilization rates, in turn, forces the ILEC to operate at a lower average capacity utilization rate and raises the capital costs per unit of output. The clear implication is that, if any adjustment to TELRIC for "risk" is to be introduced, it would more likely be a discount for the lower capital costs per unit of output that result from lower risk of underutilization, rather than a premium.

22. The case for such a discount on *new* investment in technologies that support advanced service may be weaker, however, because the technologies are mainly modular. To the extent that capacity can be adjusted rapidly and costlessly, and transferred among firms, fluctuations in demand for upstream facilities (whether those fluctuations are reduced by allowing CLECs to access those facilities at TELRIC , as we would argue, or somehow increased, as JS&T appear to argue) do not impose much in the way of real costs on the ILEC, implying that neither a premium nor discount on TELRIC wold be indicated.

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[2]Reply Affidavit of Jerry Hausman in the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket 96-98.

23. JS&T go on to try to make the case that the risk and hence the cost of capital to the ILEC rise as a result of making UNEs available at TELRIC. The cost of capital depends on market risk, which is the focus of the well-known capital asset pricing model. In the CAPM, there is a risk-return tradeoff, and higher market risk commands a higher return; but mere variability of income is not market risk. Only that risk that cannot be diversified away, that is, whose variability is correlated with that of the market, commands a higher return. Risk that *can* be diversified away commands no excess return. Moving from the financial realm to real activity, what this means is that only if the new policy causes the fortunes of the ILECs to depend more heavily on the general level of real economic activity will their cost of capital rise. In the parlance of the CAPM, their cost of capital rises only if their betas rise. (Beta is the regression coefficient of company returns on market-wide returns.)

24. Can the beta for the ILEC rise? The answer would be yes if the CLECs are more likely to lease than to build in low demand periods, and the reverse in high demand periods, and if these high and low demand periods correlate with high and low economic activity generally. But this would be perverse investment behavior — in low demand periods, there is plenty of capacity to lease, and less likelihood of recovering the costs of building those facilities. Thus, to the degree that the competitors do build their own facilities, they surely would do it in high demand, not low demand periods. So long as the ILEC's plant remains larger than the entering competitors', it will continue to have the lowest average cost, and hence be the most likely to retain customers in low demand periods. It seems thus that the beta for the ILEC will not change if the competitors do not build, and will go down if they do build. We see little possibility that the cost of capital as it is conceived by the Capital Asset Pricing Model should rise. In any event, whether beta rises or falls, the effect must be very small, far smaller than the real effect from raising capacity utilization rates discussed above.

25. In other words, so far as the *existing* plant and equipment are concerned, it is only JS&Ts confusion of average return with marginal return that leads them to conclude that investment will be impaired. Indeed, here is a perfect example of an instance in which the average return on existing assets may indeed fall (one of the intentions of the Act), but the marginal return to maintaining and upgrading these facilities will be very high. The costs of upgrading and maintaining the facilities is very small compared to their upfront cost. If the ILEC does not maintain and upgrade the facilities, it risks having the CLECs build their own facilities and steal away their customers with better service grounded on better facilities.

26. On the other hand, the availability of such facilities to the CLECs at TELRIC prices is important for several reasons. First, the market is in transition, and the CLEC may be starting at too small a scale to realize even modest economies of scale from self-provisioned equipment. Second, economies of scale in one part of the network, e.g., the loop, spill over into other parts of the network, e.g., switching, because of the costs of connecting the elements. Thus, the same

problems may well exist with respect to the new modular equipment which often has to be co-located in the central office. The ILECs have a natural advantage where they control the terms and conditions of co-location and face very few of these same co-location costs themselves. Once the CLECs have expanded to the point where they enjoy their own full scale and connectivity economies, full facilities-based competition will prevail. But at the outset, access to the ILEC platform is essential to get this competition established.[3]

27. The alternative to the musical chairs vision of competitive telephone markets, efficiently sharing facilities to fully exploit economies of scale and connectivity, is a scenario in which the CLECs introduce to the system a group of customers previously unknown to the ILEC the customers on Mars. It would also have to be the case that these customers periodically exited from the market due to some disturbance in their home market. In this scenario, the ILECs would have to add substantial facilities to accommodate the CLECs and all of their new customers. When and if these customers exit, the facilities indeed go unused, and threaten a failure of cost recovery.

28. Thus the critical factual question here is whether CLECs are expected primarily to compete against ILECs for the current customer base of the ILEC, or, alternatively, whether most of the CLECs' target customers would not otherwise be customers of the ILEC. It seems clear to us that the "musical chairs" scenario is a lot closer to what the new telecommunications market will look like than a world in which the CLECs do not compete for customers with the ILEC.

29. Indeed, it is clear that this is also what the ILECs believe. If the ILECs believed that the CLECs' customers were likely exclusively or even primarily to consist of customers for whom the ILEC was not a realistic alternative, they should welcome the opportunity to provide facilities

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[3]The ILECs may object that in cases, such as switching perhaps, where the absence of long-run scale economies will not lead the CLECs to want to share the ILECs' facilities indefinitely, that the ILECs are at risk of holding stranded investment. They invest in long-lived assets in part to serve the CLECs' needs, and then the CLECs build their own facilities before the ILECs' facilities are fully depreciated. These concerns seem unlikely to generate any "options" issues, let alone quantitatively serious ones. Given modularity in the capital components, the ILEC faces little risk of stranded investment. Modularity implies the capacity can be moved elsewhere if there is no longer sufficient local demand to utilize the facility. Moreover, demand for local service is growing rapidly, so the effect of CLECs constructing their own facilities is likely to be a reduction in the ILECs' future additions to capacity, not the stranding of prior investment. Finally, when an ILEC is faced with the prospect that a CLEC will not renew its demand for unbundled network elements, the ILEC's incentive will be to cooperate, in a more normal commercial way, with its customer. Given modularity, there is no reason to fear that the CLEC can "hold up" the ILEC in negotiations, for the ILEC always has the option of moving the capacity elsewhere.

at TELRIC. As discussed above, as long as economies of scale are still present at the ILEC's level of output, the marginal cost of providing incremental amounts of those facilities to such non-competing CLECs would be less than TELRIC. Thus, even if TELRIC were underestimated due to the omission of an estimate of option value, for provision at TELRIC to be unprofitable for the ILEC would require that the amount of any such underestimation would have to exceed the difference between average cost and marginal cost due to economies of scale. Any underestimation of TELRIC would, therefore, have to be "large" before causing any inefficiency; it is not enough to show qualitatively that some adjustment for option value is indicated.

30. But even if one did expect that the ILEC and CLEC customer bases would not overlap significantly, any appropriate adjustments to TELRIC would be small, even under relatively extreme assumptions, despite the assertions of ILEC economists which (as we have shown elsewhere) are not substantiated by more careful analysis.[4]

31. Does this mean that there is absolutely no threat to the ILECs from the CLECs building their own facilities? We cannot say no, for there is some threat, for reasons that are generally regarded as too impolite for discussion. The main reason why the CLECs would build their own facilities is to avoid depending on the ILECs, who have proven to be and can be expected to be uncooperative. In other words, the reason the CLECs would build their own facilities in place of utilizing network elements subject to significant economies is that they face high prices and poor service from the ILECs. But is this a good reason to allow the ILECs to tack on a premium to TELRIC? Should we allow the ILECs to charge the CLECs more because the CLECs will abandon the ILEC facilities because the ILECs serve them poorly? If so, then the ILECs have an incentive to treat the CLECs even worse, and to tack an even larger premium onto TELRIC. Clearly, the incentives here would not serve consumers well at all. The Commission should stick with a standard of TELRIC with a low tolerance for uncooperative behavior on the part of the ILECs.

32. The JS&T discussion of investment incentives is confused and inconsistent regarding whether the ILEC and its competitors are competing for the same customer base. Throughout, the authors make arguments that sometimes require or assume that the ILEC and its competitors do have the same customer base (e.g., arguments relating to first-mover advantages, innovation, or free riding stories) and sometimes assume that the they have completely non-overlapping customer basis (e.g., when they argue that CLEC freedom to match their customer contracts with their ILEC contracts imposes risk on the ILEC). As a factual matter, we expect that the reality is an overlapping customer base, which should dismiss the arguments that assume the opposite (indeed, for example, CLEC freedom to match their customer contracts with their ILEC contracts reduces risk and excess capacity for both the CLEC and the ILEC). And this takes us back to the

[4]See Kenneth Baseman, Frederick Warren-Boulton, and Susan Woodward, "Depreciation and Capital Recovery Issues; A Response to Professor Hausman," July 24, 1996.

inherent efficiency of sharing facilities at TELRIC and the resulting incentive to invest: the first mover advantage for new services raises the expected return from investing early rather than delaying the investment.

33. In fact, the risk and inefficiency are much greater for all if the competitor cannot access ILEC facilities. In that case, an increase in the CLEC customer base will reduce utilization rate of ILEC facilities. With access at TELRIC to facilities that exhibit economies of scale and/or scope in either the short or the long run, capacity utilization rates at ILEC facilities are effectively insulated from fluctuations in relative market share of the ILEC and its competitors, since all those customers, whether downstream CLEC customers or downstream ILEC customers, are still users of ILEC upstream facilities. The availability of sharing at TELRIC thus greatly reduces the risk of low capacity utilization for the facilities, increases average capacity utilization, and decreases capital cost per unit output for the ILEC. Absent market power by the ILEC, we would expect a cost-minimizing ILEC to promote the sharing of those facilities, with a reservation price of marginal cost, which is far below TELRIC.

34. The ILECs' unwillingness to take advantage of these cost reductions by offering access at TELRIC is itself a telling indictment of their monopoly power ---- that they are willing to give up something that so reduces their costs because it also reduces the costs of their rivals by even more.

35. In sum, even if some facilities should have a real option component in their TELRIC price, this can be handled by using a higher cost of capital in calculating TELRIC. Furthermore the requisite adjustment will not be high, given what we know about betas and risk premiums. Hausman has tried before to wildly exaggerate the likely impact of any real option adjustment (i.e., a two to three-fold rise in the level of cost).[5] Here, once again, we see the defensive rhetoric of the ILECs far overstretching the economic significance of this issue. The "real options" issue is at most an issue of degree, and can never imply that unbundling of network elements should not be required. Efficient unbundling is the main issue, and any minor adjustments to TELRIC are merely a side issue.

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[5]See footnote 3, supra.

I declare, under penalty of perjury, that the foregoing is true and correct.

Executed on June 8th, 1999.

Kenneth Baseman

I declare, under penalty of perjury, that the foregoing is true and correct.

Executed on June 8th, 1999.

Frederick R. Warren-Boulton

I declare, under penalty of perjury, that the foregoing is true and correct.

Executed on June 9, 1999.

Susan Woodward

Revised February 26, 1998

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Education

1975 Ph.D. Candidate, Economics, Stanford University (M.A. plus two years additional course and seminar work required for admission to Ph.D. candidacy.)
1975 M.A., Economics, Stanford University
1971 B.A., Economics, *magna cum laude*, Carleton College

Experience

Mr. Baseman is a Principal of Microeconomic Research and Consulting Associates, Inc., (MiCRA). He was a founder of the firm in 1991.

Prior to joining MiCRA, Mr. Baseman was a vice president of ICF Consulting Associates and previously employed by the Antitrust Division of the U.S. Justice Department (1975-1981, 1983-1985) and by Economists, Inc. (1981-1983). In these positions, he developed expertise in a wide variety of industries, including: telecommunications; computer software; cable television; crude oil markets; tires; numerous chemicals; newspapers; electric utilities; air conditioning; elevators; jet engines; and various aspects of the television industry, including program production, contractual licensing arrangements, music licensing, TV set manufacturing and R&D joint ventures. As a private consultant, his work has been primarily focused on providing economic analysis for antitrust or regulatory issues in these and many other industries. Mr. Baseman has twice testified as an economic expert for the Department of Justice.

Publications

“Exclusionary Behavior in the Market for Operating System Software: the Case of Microsoft,” in *Opening Networks to Competition: the Regulation and Pricing of Access,* David Gabel and David Weiman, eds.; Kluwer Press, 1996, with Frederick R. Warren-Boulton and Glenn Woroch.

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"The Detroit Newspaper Joint Operating Agreement," in Kwoka and White, eds., *The Antitrust Revolution*, Harper Collins (1993).

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"Open Entry and Cross-Subsidization in Regulated Markets," in Gary Fromm, ed., *Economics of Public Regulation*, National Bureau of Economic Research and M.I.T. Press, Cambridge, Massachusetts, 1981.

Other Papers

“Depreciation Policy in the Telecommunications Industry: Implications for Cost Recovery by the Local Exchange Carriers”, co-authored with Harold Van Gieson, December 1995.

"Microsoft Plays Hardball: Use of Exclusionary Pricing and Technical Incompatibility to Maintain Monopoly Power in Markets for Operating Software," co-authored with Frederick R. Warren-Boulton and Glenn A. Woroch, presented at Columbia University Institute for Tele-Information on Sustaining Competition in Network Industries through Regulating and Pricing Areas, November 1993.

"The Economics of Intellectual Property Protection for Software: The Proper Role for Copyright," co-authored with Frederick R. Warren-Boulton and Glenn A. Woroch, presented at American Committee for Interoperable Systems, June 1994.

"The Effect of Deregulation on Cable Subscribers," co-authored with John Woodbury, Oct. 1990, presented at American Enterprise Institute conference, Policy Approaches to Deregulation of Network Industries.

"The Economics of Bell Operating Company Diversification in the Post-Divesture Telecommunications Industry," co-authored with Stephen Silberman, with the assistance of Roger Noll, ICF, Inc., September 1986.

"A Framework for Economic Analysis of Electronic Media Concentration Issues," co-authored with Bruce Owen, Economists, Inc., December 1982.

Other Professional Experience

Journal referee: *International Economic Review*, *Journal of Industrial Economics*, and *International Journal of Industrial Organization*.

Trial Testimony

Direct and cross examination testimony for MCI on the "public interest" issues regarding entry by the Bell Operating Companies into long distance service in Ohio, Wisconsin, and Georgia, (1996-97).

Testified on market definition and competitive effects of joint ownership of two competing daily newspapers in U.S. vs. Nat, L.C. and D. R. Partners, (May 1995).

Testified on market power, market definition and vertical restraint issues in Tarrant v. Trane (November 1993).

Expert witness for the Antitrust Division on the Detroit Newspaper Joint Operating Agreement (August 1987). Testified that the Detroit *Free Press* was not a failing newspaper when it agreed to joint operations.

Deposition Testimony

- LePages's v. 3M (Minnesota Mining and Manufacturing Company)
- U.S. vs Nat, L.C. and D. R. Partners, (April 1995).
- PMBR v. Harcourt Brace Jovanovich, et al. (February 1994).
- Deposed in Detroit JOA proceeding (July 1987).
- Deposed by the FTC concerning Henkel's acquisition of Parker Chemical (January 1986).
- U.S. v. Kentucky Utilities, (July 1985).

Expert Affidavits

- Rocket Holding, Inc. v. McNeilus Truck and Manufacturing (February 1993).

- PMBR v. Harcourt Brace Jovanovich, et al. (February 1994).

- AD/SAT v. McClatchy Newspapers (July 1995).

Expert Statements Submitted to Regulatory Agencies

- Affidavit testimony (co-authored with A. Daniel Kelley) on behalf of MCI concerning Bell Atlantic's proposed acquisition of GTE (CC Docket No. 98-148) and SBC's proposed acquisition of Ameritech (CC Docket No. 98-141) (1998)

- Affidavit testimony for MCI on the "public interest" issues regarding entry by the Bell Operating Companies into long distance service in state regulatory hearings in New York, New Jersey, Maryland, Ohio, Wisconsin, Georgia and South Carolina, (1996-97).

- Affidavit testimony (co-authored with Frederick Warren-Boulton) for MCI to the FCC on the "public interest" issues regarding entry by the Bell Operating Companies into long distance service in Michigan and South Carolina, (1997).

- "The Economics of Bidding for Scarce Resources: The Lessons of Monopoly Preemption as Applied to FCC Auctions of LMDS Licenses", August 1996, submitted on behalf of WebCel in FCC Docket No. 96-98.

- "Depreciation and Capital Recovery Issues, A Response to Professor Hausman", co-authored with Frederick Warren-Boulton and Susan Woodward, July 1996, submitted on behalf of MCI in FCC Docket No. 96-98.

- Testimony in FERC Docket ER95-836-000 on behalf of wholesale customers, who were objecting to certain aspects of Maine Public Service's transmission and ancillary service tariff (August 1995).

- A comment on the relationship between advertising and sales, January 1995, submitted on behalf of MCI in FCC Docket No. 92-77, concerning proposals for implementing billed party preference in the selection of long distance carriers.

- Affidavit, co-authored with Robert J. Reynolds, concerning an FERC abandonment proceeding, October 1991, submitted on behalf of Sun Refining and Marketing Company in FERC Docket No. CP91-2819-000.

- Affidavit concerning Expanded Interconnection with Local Telephone Company Facilities, September 1991, submitted on behalf of MCI in Federal Communications Commission

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- "The Economic Effects of Cable Deregulation," co-authored with John Woodbury, Frederick Warren-Boulton and Daniel Sherman, May 1990, submitted on behalf of the National Cable Television Association in Federal Communications Commission MM Docket No. 90-4.

- "The Economics of Local Telephone Company Integration into the Retailing of Video Programming," December 1988, submitted on behalf of the National Cable Television Association in the Federal Communications Commission Docket No. CC 87-266.

- "The Choice of Productivity Offsets for Rate Cap Regulation," July 1988, submitted on behalf of MCI in Federal Communications Commission Docket No. CC 87-313.

- "An Analysis of the Utility of Price Cap Regulation as Applied to the Local Exchange Carriers," co-authored with Stephen Silberman, December 1987, submitted on behalf of MCI in Federal Communications Commission Docket No. CC 87-313.

- "The Economics of Line of Business Restrictions and Structural Separations," co-authored with Stephen Silberman, January 1986, submitted on behalf of MCI in Federal Communications Commission Docket No. CC 85-229.

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Visiting Lecturer of Public and International Affairs, Woodrow Wilson School of Public and International Affairs, Princeton University, Princeton, NJ; Spring Semester, 1991

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Research Associate Professor of Psychology, The American University, Washington, D.C.; September 1983 - 1990.

Deputy Assistant Attorney General for Economic Analysis, Antitrust Division, U.S. Department of Justice, Washington, D.C.; October 1985 - May 1989.

Director, Economic Policy Office, Antitrust Division, U.S. Department of Justice, Washington, D.C.; September 1983 - September 1985.

Research Associate, Center for the Study of American Business, Washington University in St. Louis; July 1978 - June 1985.

Associate Professor, Department of Economics, Washington University in St. Louis; July 1978 - June 1985. Chairman, Graduate Committee, 1978 - 1980. Chairman, Undergraduate Committee, 1980 - 1983.

Assistant Professor, Department of Economics, Washington University in St. Louis; September 1972 - June 1978.

Assistant in Instruction, Woodrow Wilson School of Public and International Affairs, Princeton University, Princeton, N.J.; 1969 - 1971.

Research Consultant, Ford Foundation, Kingston, Jamaica, W.I.; Summer 1969.

Fields Taught

Graduate: Industrial Organization, Economic Development and Planning, Microeconomic Theory, International Trade, International Finance, Economic Theories of Behavior, Applied Microeconomics.

Undergraduate: Government and Business, Industrial Organization, International Trade, International Finance, Economic Development, Intermediate Microeconomic Theory, Intermediate Macroeconomic Theory, Introductory Microeconomic Theory, Introductory Macroeconomic Theory.

Grants

National Science Foundation. Grant title: "Income Maximizing in Choice and Rate Effects," 1988 - 1991.

National Science Foundation. Grant title: "Application of Economic Theory to Operant Schedule Effects," 1985 - 1987.

National Science Foundation. Grant title: "Income and Choice," 1983 - 1985.

Professional Activities

Referee, *American Economic Review, The Bell Journal of Economics/Rand Journal, Economic Inquiry, Industrial Organization Review, Journal of Industrial Economics, Journal of Law and Economics, Journal of Political Economy, Quarterly Journal of Economics, Southern Economic Journal.*

Member, Editorial Board, *International Journal of the Economics of Business.*

Member, American Bar Association, American Economic Association, Southern Economic Association, Western Economic Association.

Languages

French, German

Publications

"Market Definition and the Price Effects of Mergers: Staples- Office Depot (1997)," in *The Antitrust Revolution: Economics, Competition and Policy*, John E. Kwoka and Lawrence J. White, eds.; Oxford University Press, third edition, 1999, with Serdar Dalkir.

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